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ABSTRACT

The United States Training and Employment Service General Aptitude Test Battery (GATB), first published in 1947, has been included in a continuing program of research to validate the tests against success in many different occupations. The GATB consists of 12 tests which measure nine aptitudes: General Learning Ability; Verbal Aptitude; Numerical Aptitude; Spatial Aptitude; Form Perception; Clerical Perception; Motor Coordination; Finger Dexterity; and Manual Dexterity. The aptitude scores are standard scores with 100 as the average for the general working population, and a standard deviation of 20. Occupational norms are established in terms of minimum qualifying scores for each of the significant aptitude measures which, when combined, predict job performance. Cutting scores are set only for those aptitudes which aid in predicting the performance of the job duties of the experimental sample. The GATB norms described are appropriate only for jobs with content similar to that shown in the job description presented in this report. A description of the validation sample is included. (AG)

FILE COPY

S-38

FINAL REPORT

RESTRICTED

ED 060078

TECHNICAL REPORT

ON

STANDARDIZATION OF THE GENERAL APTITUDE TEST BATTERY

FOR

FILE CLERK II 1-17.02 209.388

B-270 S-38

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EDUCATION & WELFARE
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STANDARDIZATION OF THE GENERAL APTITUDE TEST BATTERY FOR FILE CLERK II 1-17.02

B-270

Summary

The General Aptitude Test Battery was administered during the summer and fall of 1950 to 215 women who were to be employed as clerical workers in the Subscription Department of Esquire-Coronet Publishing Company at Boulder, Colorado. Thirty-two people did not complete the training period. Of the remaining 183 individuals, 50 were employed as File Clerks; 33 as Addressing Machine Operators; 30 as Adjustment Clerks; 14 as Inserting Clerks; 14 as Collection Clerks; 13 as Mailing Clerks; 10 as Releasing Clerks; 10 as Circulation Clerks; and 9 as Editing Clerks. Hiring was done without regard to test performance. Only the test data for the File Clerks are included in this report. The other clerical occupations were excluded from this study because the jobs did not appear to be interchangeable and because of differences in knowledge and skill requirements. Supervisory ratings based on quantity and quality of work were used for the criterion. On the basis of high means, low standard deviations, correlations with the criterion and the job analysis, Aptitudes G-Intelligence and Q-Clerical Perception were selected for inclusion in the test norms.

GATB Norms for File Clerk II 1-17.02, B-270

Table I shows for B-1001 and B-1002, the minimum acceptable score for each aptitude included in the test norms for File Clerk II 1-17.02.

TABLE I

Minimum Acceptable Scores on B-1001 and B-1002 for File Clerk II 1-17.02

B-1001			B-1002		
Aptitude	Tests	Minimum Acceptable Aptitude Score	Aptitude	Tests	Minimum Acceptable Aptitude Score
G	CB-1-H CB-1-I CB-1-J	100	G	Part 3 Part 4 Part 6	100
Q	CB-1-B	95	Q	Part 1	95

Effectiveness of Norms

The data in Table V indicate that 12 of the 17 poor workers, or 71% of them, did not achieve the minimum scores established as cutting scores on the recommended test norms. This shows that 71% of the poor workers would not have been hired if the recommended test norms had been used in the selection process. Moreover, 31 of the 36 workers who made qualifying test scores, or 86%, were good workers.

TECHNICAL REPORT

I. Problem

This study was conducted to determine the best combination of aptitudes and minimum scores to be used as norms on the General Aptitude Test Battery for the occupation of File Clerk II 1-17.02.

II. Sample

During the summer and fall of 1950, 215 women were given the General Aptitude Test Battery prior to their employment with the Esquire-Coronet Publishing Company, Boulder, Colorado. Thirty-two people did not complete the training period. Fifty people were hired as File Clerks and the remainder were employed to do other clerical jobs. The applicants who were given the test, were selected from the local office files. The labor market in this area was very "loose" at the time and the call-ins were the best of the local applicants. Test results were not used as a selection factor in the employment or placement of the people who were hired. All of the individuals included in this sample of File Clerks completed their training period and were rated by the same supervisor at the end of six months of work.

Table II shows the means, standard deviations, ranges, Pearson product-moment correlations (corrected for broad categories) with the criterion, and the standard errors of correlation for age and education. Experience was not a factor to be analyzed in this study because none of the workers had previous experience in a publication subscription department, and all the individuals had worked the same length of time when rated—six months.

TABLE II

Means (M), Standard Deviations (σ), Ranges, Pearson Product-Moment Correlations (Corrected for Broad Categories) with the Criterion ($_{c}r$), and the Standard Errors of Correlation ($\sigma_{c}r$) for Age and Education

File Clerk II 1-17.02

N = 50

	M	σ	Range	$_{c}r$	$\sigma_{c}r$
Age (years)	28.58	9.80	17-53	.198	.136
Education (years)	12.14	1.73	10-17	-.024	.141

Four of the women in the sample are over 45 years of age. However, since their GATB test scores and their criterion ratings appear to be comparable to the rest of the workers, they were included in the final sample. The mean education bears out the statement that there was a "loose" labor market at this time. More than fifty percent of the workers in the sample

are high school graduates, and 13 of the 50 people in this group have continued their education beyond high school. There is no significant correlation between age and the criterion, nor between education and the criterion.

III. Job Description

Job Title: File Clerk II 1-17.02

Maintains files of materials such as addressograph plates, donor cards, correspondence, paid ledgers and attachments. Reads material and checks names and numbers to sort, arrange and file materials alphabetically or numerically in cabinets or drawers. Matches names, or numbers and produces filed materials on written request. Inspects files and makes corrections. Removes old materials from files periodically or on written order.

May determine action necessary by other departments and forward materials to them. May verify doubtful geographical locations by checking Post Office Guide and Atlas. May place identification mark, such as number, on material to be filed.

The job analysis indicates that the following aptitudes are significant for this occupation:

Clerical Perception - in checking names and numbers to file them in proper sequence and to remove materials from the files.

Intelligence - in supplying identification marks, determining action and checking geographical locations.

Verbal Aptitude - in reading materials and interpreting written and oral instructions.

Finger Dexterity - in separating materials in the files to make insertions or withdrawals.

IV. Experimental Battery

All of the tests of the GATB, with the exception of Part E, were administered to the sample group.

V. Criterion

All individuals started to work for the company at approximately the same time and each was rated after working six months. The normal training time was one to three months. One rating on the quantity and quality of work for each individual, based on a cumulation of the six-months' production and error records was secured. The ratings were not numerical, but were made in five broad categories of superior, excellent, good, fair, and poor. The adjective ratings were converted to quantitative values for the computation of correlation coefficients.

VI. Statistical and Qualitative Analysis

Means, standard deviations, and correlations with the criterion were calculated for both test and aptitude scores.

Table III shows the means, standard deviations, Pearson product-moment correlations (corrected for broad categories) with the criterion and standard errors of correlation for the aptitudes of the GATB. Table IV shows the means, standard deviations, standardized means, standardized standard deviations, Pearson product-moment correlations (corrected for broad categories) with the criterion and the standard errors of correlation for the tests of the GATB.

The means and standard deviations of the aptitudes and standardized means and standard deviations of the tests are comparable to general population norms with a mean of 100 and a standard deviation of 20.

TABLE III

Means (M), Standard Deviations (σ), Pearson Product-Moment Correlations (Corrected for Broad Categories) with the Criterion ($_{c}r$), and Standard Errors of Correlations ($\sigma_{c}r$) for the Aptitudes of the GATB

File Clerk II 1-17.02

N = 50

Aptitudes	M	σ	$_{c}r$	$\sigma_{c}r$
G-Intelligence	115.120	15.318	.282	.130
V-Verbal Aptitude	114.680	18.764	.442	.114
N-Numerical Aptitude	106.940	17.564	.193	.136
S-Spatial Aptitude	109.900	16.153	-.232	.134
P-Form Perception	108.360	14.252	-.215	.135
Q-Clerical Perception	109.300	12.599	.508	.105
A-Aiming	109.800	20.684	.022	.141
T-Motor Speed	102.460	20.114	-.055	.141
F-Finger Dexterity	109.740	16.771	-.174	.137
M-Manual Dexterity	103.360	16.758	-.224	.134

TABLE IV

Means (M), Standard Deviations (σ), Standardized Means (M'), Standardized Standard Deviations (σ'), Pearson Product-Moment Correlations (Corrected for Broad Categories) with the Criterion ($_cr$), and Standard Errors of Correlation (σ_{cr}) for the Tests of the GATB

File Clerk II 1-17.02

N = 50

Test	M	σ	M'	σ'	$_cr$	σ_{cr}
A-Tool Matching	23.540	4.158	108	15	-.133	.139
B-Name Comparison	80.480	12.771	109	13	.491	.107
C-H Markings	47.780	8.056	110	22	-.006	.141
D-Computation .	28.380	6.053	105	16	.232	.134
F-Two-Dimensional Space	24.600	7.268	105	18	-.179	.137
G-Speed	133.460	28.697	98	28	-.139	.139
H-Three-Dimensional Space	21.080	5.488	110	16	-.228	.134
I-Arithmetic Reason	10.860	3.175	113	19	.243	.133
J-Vocabulary	27.660	8.634	115	19	.443	.114
K-Mark Making	74.400	8.144	107	17	.070	.141
L-Form Matching	28.420	7.186	106	18	-.240	.133
M-Place	88.360	7.028	101	16	-.178	.137
N-Turn	104.160	8.346	107	19	-.088	.140
O-Assemble	29.760	4.283	109	19	-.107	.140
P-Disassemble	30.200	2.778	107	15	-.268	.131

Aptitude G - Intelligence has the highest mean for the sample, in addition to a low standard deviation and a significant correlation with the criterion. It also appears to be important, as indicated in the job analysis, to supply the correct identification marks to the materials to determine action and to check geographical locations. Aptitude G is also important in learning and understanding the job.

Aptitude Q - Clerical Perception is most evident in the job analysis, since the job duties include the checking of names and numbers to file in the proper sequence. Aptitude Q has the lowest standard deviation in this sample and the highest correlation with the criterion.

Aptitude V - Verbal Aptitude has a high mean and low standard deviation and also shows significant correlation with the criterion. However, Verbal Aptitude does not seem to be as necessary in the job analysis as Aptitudes G and Q. In addition, Aptitude V does not materially contribute to the selectivity of Aptitude G. Therefore Aptitude V has been omitted from the norms.

Aptitude F - Finger Dexterity is possibly needed to manipulate materials in the files. However, the job analysis did not bring this out and there

is little statistical evidence to support the inclusion of Aptitude F. Therefore Aptitude F was omitted from the norms.

On the basis of the job analysis, a high mean, low standard deviation, and significant correlation with the criterion, Aptitude G was selected for inclusion in the test norms. On the basis of high correlation with the criterion and importance as indicated in the job analysis, Aptitude Q was included in the norms. The cutting scores were set at one standard deviation below the mean, rounded to the nearest five-point interval. This resulted in minimum acceptable scores of 100 for Aptitude G and 95 for Aptitude Q.

For the purpose of computing the tetrachoric correlation coefficient and its standard error, and the Chi Square value, the criterion was dichotomized by placing those workers who received ratings of Good, Excellent, and Superior into the high criterion group and those workers who received ratings of Fair and Poor into the low criterion group.

Table V shows the relationship between test norms consisting of Aptitudes G and Q with critical scores of 100 and 95, respectively, and the dichotomized criterion for File Clerk II 1-17.02. Workers in the high criterion group have been designated as "good workers" and those in the low criterion group as "poor workers."

TABLE V

Relationship between Test Norms Consisting of Aptitudes G and Q with Critical Scores of 100 and 95, Respectively, and the Dichotomized Criterion for File Clerk II 1-17.02

	Non-Qualifying Test Scores	Qualifying Test Scores	Total
Good Workers	2	31	33
Poor Workers	12	5	17
Total	14	36	50

$r_{tet} = .90 \qquad X^2 = 20.083$

$\sigma_{r_{tet}} = .24 \qquad p/2 < .0005$

The tetrachoric correlation of .90, which is over three times its standard error, indicates a very high and significant relationship between the norms and the criterion for this sample. The Chi Square value of 20.083 and p/2 of less than .0005 indicates that there are less than five chances in 10,000 that the obtained positive relationship occurred by chance.

VII. Conclusions

On the basis of job analysis, mean scores, standard deviations, correlation coefficients, and their combined predictive efficiency, it is recommended that Aptitudes G and Q with minimum scores of 100 and 95 respectively, be used as norms for File Clerk II 1-17.02.

The same norms are applicable to the separate answer sheet form of the GATB, B-1002.